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(54) Method of producing a spring insert

Verfahren zum Herstellen eines Federeinsatzes

Procédé de fabrication d'un ressort inséré

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Description

Background of the invention

The invention relates to a method of producing a spring insert from strings of springs which are individually encased in a pocket of material, so-called pocketed springs, said strings having an adhesive applied and being compressed to form the spring insert, said strings having different resiliency and/or damping characteristics, and said strings are cut from at least one length, and where each length is fed to a cutting mechanism.

The said method is known from EP-A-0089789, and by this known method it is possible in a surprisingly simple manner to produce a spring insert with ideal characteristics, in that there can be built up a spring insert which is in accordance with the load on the individual parts of the spring insert. This permits production of spring inserts, and herewith mattresses, cushions etc., which are in complete accordance with the degree of support they are desired to provide.

Further another method is known from EP-A-0421495 which method involve the following steps and features in producing a spring insert:

A string is cut from a length in a cutting device to which several lengths are supplied, and each length is fed to a cutting mechanism by means of an adjustable feeding arrangement in such a manner that the selection of the length and the length of the string can be adjusted,

an adhesive is applied to the string during its movement past one or more nozzles before the compression,

the adhesive is applied only to the outer side of the pockets where pockets of abutting strings lie up against each other after the compression,

and the adhesive is pumped out through the nozzle(s) in a jet on the outer side of the pocket when the pocket is opposite the nozzle(s).

However, none of the mentioned applications shows a suitable way of orienting the length before applying the adhesive so that the lengths and the strings can be conveyed without risk for being displaced in relation to the support and one another.

Advantages of the invention

With the method according to the invention, this can be effected in a simple manner, such as disclosed in the characterising portion of the claim, when the lengths are arranged so that they are fed with the longitudinal axes of the pocket-springs being horizontal, and thereafter the string are tipped 90° before applying the adhesive, whereby the length and the string are conveyed without risk of displacement in relation to their support or one another.

The drawing

In the following section, an example of a plant for the execution of the method will be described in more detail with reference to the drawing, where

- fig. 1 shows a perspective drawing of a plant according to the invention,
- fig. 2 shows the actual cutting-off device with the one length in use,
- fig. 3 shows the cutting-off device with a second length in use,
- fig. 4 shows the turntable before the turning of the string,
- fig. 5 shows the turntable during the turning of the string,
- fig. 6 shows the actual compression device before the compression of a string with adhesive applied, and
- fig. 7 shows the compression of the string against the remaining strings during the production of a spring insert.

Description of the example embodiment

A plant for the execution of the method is illustrated in fig. 1.

The plant comprises a feeding section 1, which will be described in more detail with reference to figs. 2 and 3, a turning section 2, which will be described in more detail with reference to figs. 4 and 5, and an adhesive application section 3 and a compression section 4 which will be described in more detail with reference to figs. 6 and 7.

As shown in figs. 2 and 3, the feeding section 1 consists of a frame 5, on the top of which are supported a number of wheels 6 corresponding to the number of pocket-spring lengths 7, 8.

These lengths 7 and 8 can have different resiliency and/or damping characteristics, so that in the example embodiment shown there can be produced a finished spring insert 9 consisting of two different types of pocket-springs.

The wheels 6 are preferably sprocket-formed so that the lengths 7 and 8 can be fed by rotation of the wheels. In order to prevent the lengths 7 and 8 from jumping out of the wheel 6, a shield 10 can be mounted over a part of the wheels' circumference.

Under each set of wheels 6 there is mounted a further set of drive rollers 11 for each length 7, 8, so that

each individual length can be fed in a precise manner. In practice, the wheel sets 6, 11 will be synchronized by means of a chain drive or the like.

Under the drive roller 11 there is mounted a cutting mechanism 12 comprising two jaws 13 which can be moved in a reciprocating manner by means of an actuator 14, so that the lengths 7 and 8 can be fed between the jaws 13 when these are separated.

In this position, the drive roller 11 can feed a certain number of pockets in the length 7 and 8 so that a given number of pockets, corresponding to the length of the string 15, will form one element in the finished spring insert 9.

When the string 15 has been formed, the jaws 13 are closed and the length is cut over either mechanically or thermally.

Below the cutting mechanism 12 there is mounted a conveyor belt 16. This conveyor carries the string 15 further to an angularly-extending belt 17 which leads the string 15 forward to the turning section 2.

As shown in figs. 4 and 6, this section is configured with a conveyor belt 18 on which the string 15 is fed forward in the section.

When the belt 18 is stopped, a boom 19 operated by actuators 20 pushes the string over the side where it falls down on a side-stop 21. As shown in fig. 5, the side-stop is thereafter tipped so that the string falls down into a gutter 22.

In the gutter 22, the string 15 is fed into a chain conveyor 23 which is moved from the turning section 2 and further through the compression section 4.

Hereafter, the conveyor 23 feeds the string 15 past an adhesive application device 24 which can be of any suitable type.

A fluid adhesive is advantageous, the reason being that this can be pumped out through nozzles via a pipe 25. This makes it possible for the adhesive to be pumped out in shots, and the adhesive 26 can hereby be applied to the outer side of each pocket-spring in the string as this passes the nozzle(s).

The chain conveyor 23 stops when the string 15 is standing opposite a pusher arm 27, this being provided with an end profile which enables it to lie up against the string 15.

Hereafter, an actuator 28 can feed the string 15 with adhesive 26 on to an underlayer 29 where it can be pushed up against preceding strings for gluing together with the outermost string.

The spring insert 9 is hereby built up of strings 15 which one after another are glued together to form the finished insert 9.

When the last string 15 has been glued on, the belt 29 is started and the spring insert is led away.

The following is a description of the method.

The lengths 7 and 8 with the desired resiliency and damping characteristics and dimensions are fed to the plant in the form of endless lengths of pocket-springs 7 and 8.

In the example shown there are two lengths with the same outer dimension, but there will be nothing to prevent the use of several lengths and lengths with other dimensions. There can hereby be produced spring inserts of any desired kind and character, also including spring inserts comprising pocket-springs of different heights.

The plant is controlled in a commonly-known manner by microprocessors so that it is possible to select to feed strings of any desired length, said strings then being tipped upright and receiving an application of adhesive before the final compression.

The whole method is controlled so that all movements are synchronized, whereby strings can be produced at a very high rate of production, the reason being that the whole of the flow can be effected at the same tempo.

The choice of pocket-spring strings is determined by the activation of the sets of feeding wheels, whereby strings can be produced at normal rates of production, even when there are frequent changes between the strings.

Claims

1. Method of producing a spring insert from strings of springs which are individually encased in a pocket of material, so-called pocketed springs, said strings having an adhesive applied and being compressed to form the spring insert, said strings (15) having different resiliency and/or damping characteristics are used, where said string (15) is cut from at least one length (7, 8), and where each length is fed to a cutting mechanism (12, 13), **characterized** in that the length(s) (7, 8) are fed over wheels/sprockets (6, 11) with horizontally-extending axes to the cutting mechanism (12, 13), after which the string (15) is fed in a commonly-known manner on to a turning table (2) where the string (15) is tipped upright, whereafter the string (15), by means of a chain conveyor (23) in the form of an endless chain over carrier wheels with vertical axes, is fed past the adhesive application nozzle(s) (24) before being positioned on a horizontally-displaceable arm (27) which thereafter presses the string (15) up against the preceding string in the spring insert (9).

Patentansprüche

1. Verfahren zum Herstellen eines Federeinsatzes aus Reihen von Federn, die einzeln in Materialhülsen gekapselt sind, sogenannte gekapselte Federn, wobei die genannten Reihen einen Klebstoffauftrag aufweisen und verpreßt werden, um den Federeinsatz zu bilden, und die genannten Reihen (15) verschiedene Elastizitäts- und/oder Dämpfungscharakteristiken aufweisen und die genannte Reihe (15) von mindestens einer Bahn (7, 8) abgeschnitten wird, wobei jede Bahn einer Schneidvorrichtung (12, 13) zugeführt wird,

dadurch gekennzeichnet, daß die Bahn(en) (7, 8) über Rollen/Kettenräder (6, 11) mit horizontal sich erstreckenden Achsen zu der Schneidvorrichtung (12, 13) geführt werden, nach welcher die Reihe (15) in einer an sich bekannten Weise zu einem Drehtisch (2) geführt wird, wo die Reihe (15) aufrecht gekippt wird, wonach die Reihe (15) mittels einer Kettenfördervorrichtung (23) in Form einer Endlos-Kette, die über Trägerrollen mit vertikalen Achsen läuft, geführt wird, vorbei an der(n) Klebstoffauftragedüse(n) (24), bevor sie auf einem horizontal verschiebbaren Ausleger (27) positioniert wird, der danach die Reihe (15) gegen die vorhergehende Reihe im Federeinsatz (9) preßt.

Revendications

1. Procédé pour produire un insert élastique à partir de chapelets de ressorts qui sont enveloppés individuellement dans une poche de matière, appelés ressorts ensachés, ces chapelets ayant un adhésif qui leur est appliqué et étant comprimés pour former l'insert élastique, lesdits chapelets (15) utilisés ayant des caractéristiques d'élasticité et/ou d'amortissement différentes, dans lequel lesdits chapelets (15) sont coupés à partir d'au moins une longueur (7,8) et dans lequel chaque longueur est acheminée à un mécanisme de coupe (12, 13), caractérisé en ce que les longueurs (7, 8) sont acheminées par l'intermédiaire de roues/pignons (6, 11) avec des axes horizontaux vers le mécanisme de coupe (12, 13) après quoi le chapelet (15) est acheminé d'une manière usuelle sur une table de pivotement (2) où le chapelet (15) est redressé par basculement, après quoi le chapelet (15), au moyen d'un convoyeur à chaîne (23) sous la forme d'une chaîne sans fin montée sur des roues porteuses à axes verticaux, passe devant au moins une buse d'application d'adhésif (24) avant d'être positionné sur un bras déplaçable horizontalement (27) qui presse ensuite le chapelet (15) contre le chapelet précédent dans l'insert élastique (9).

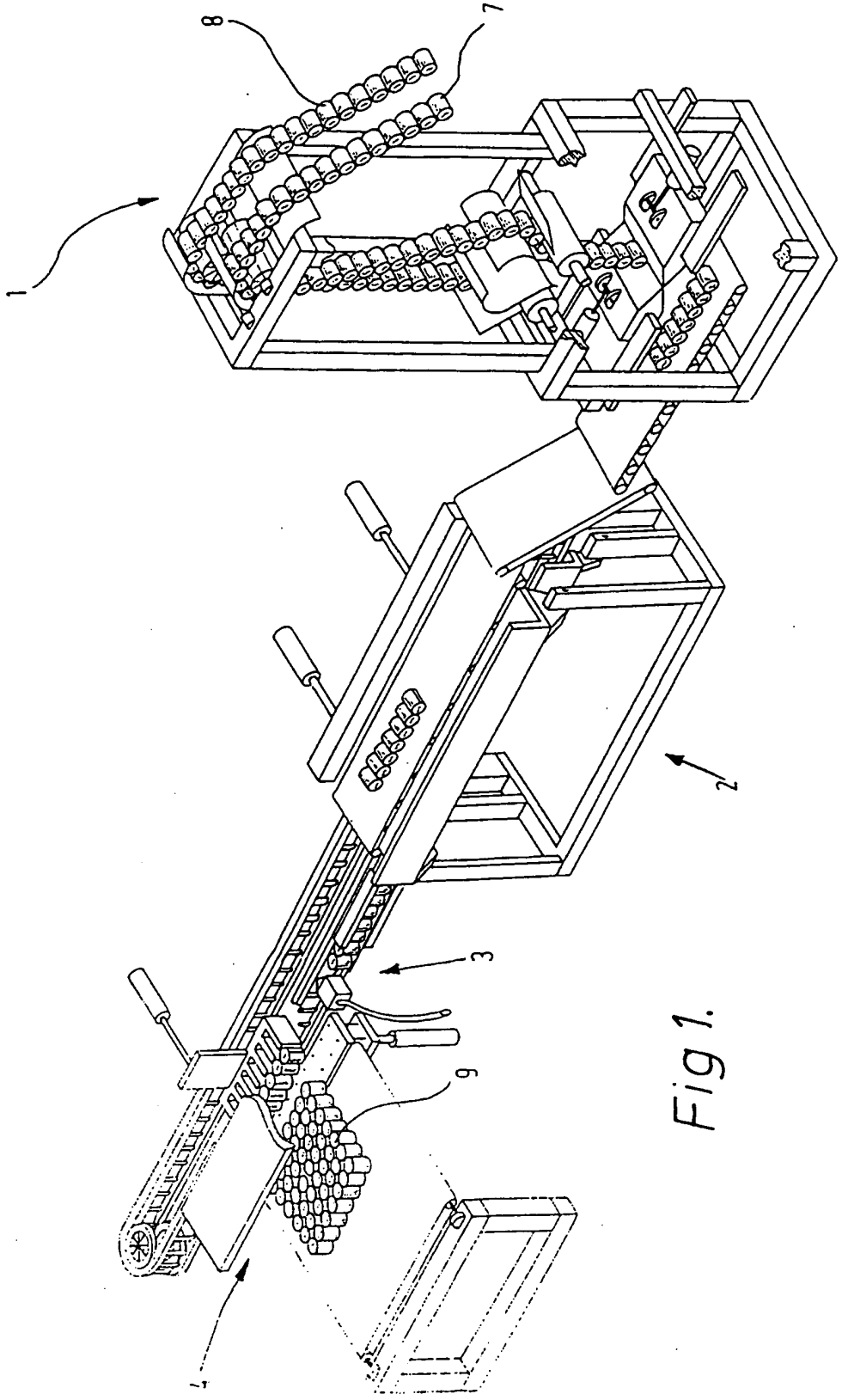

Fig 1.

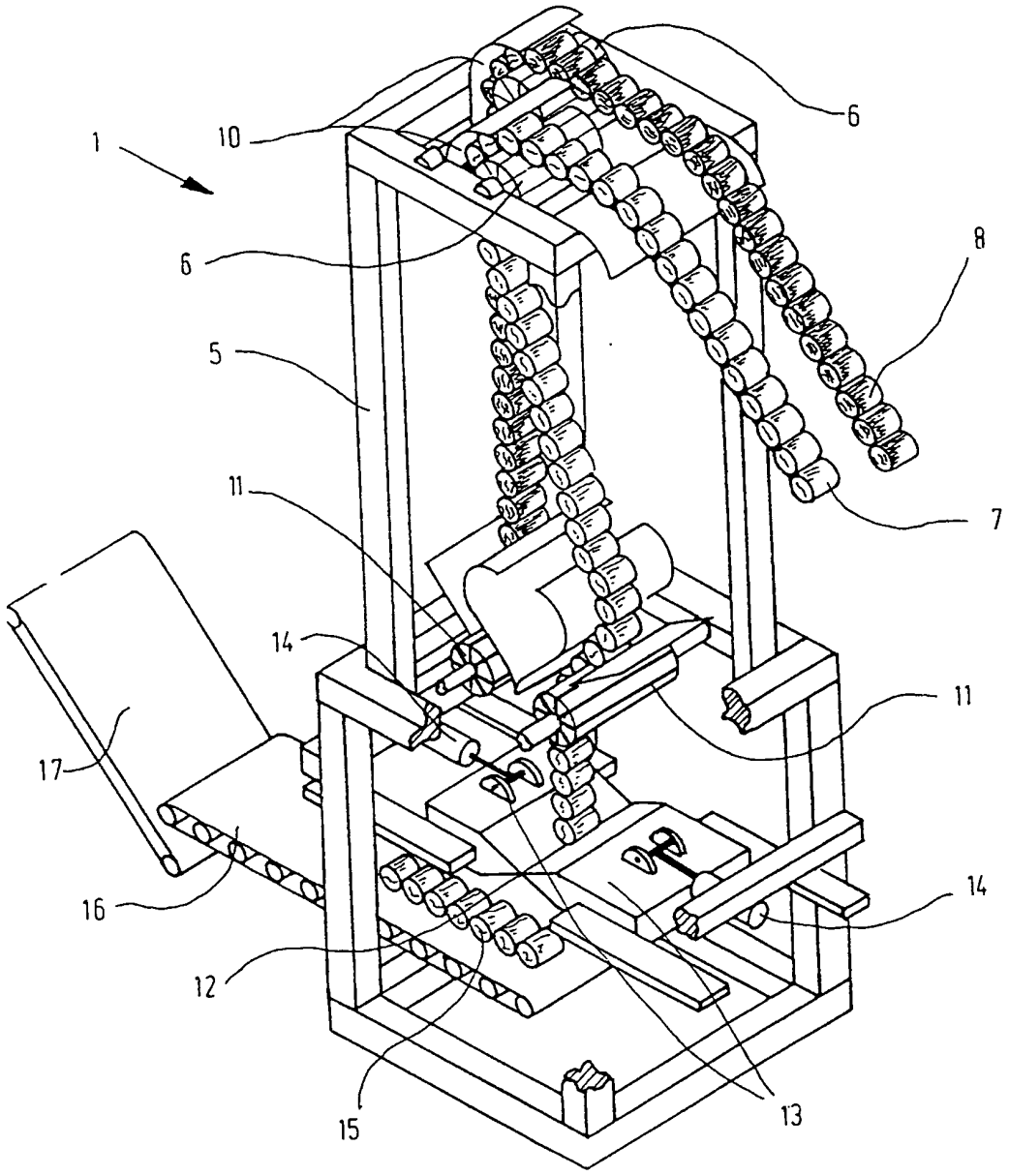

Fig 2.

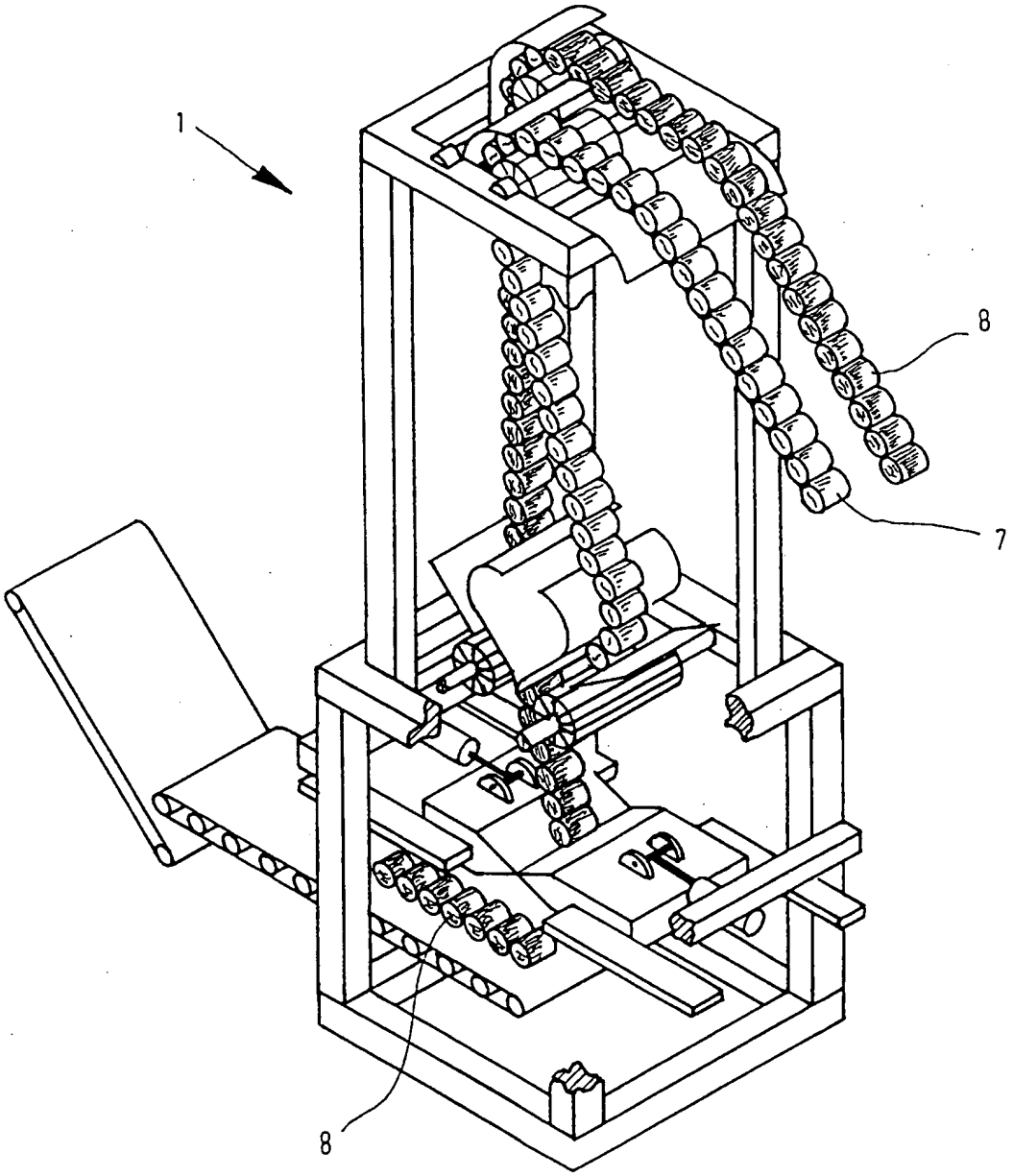

Fig 3.

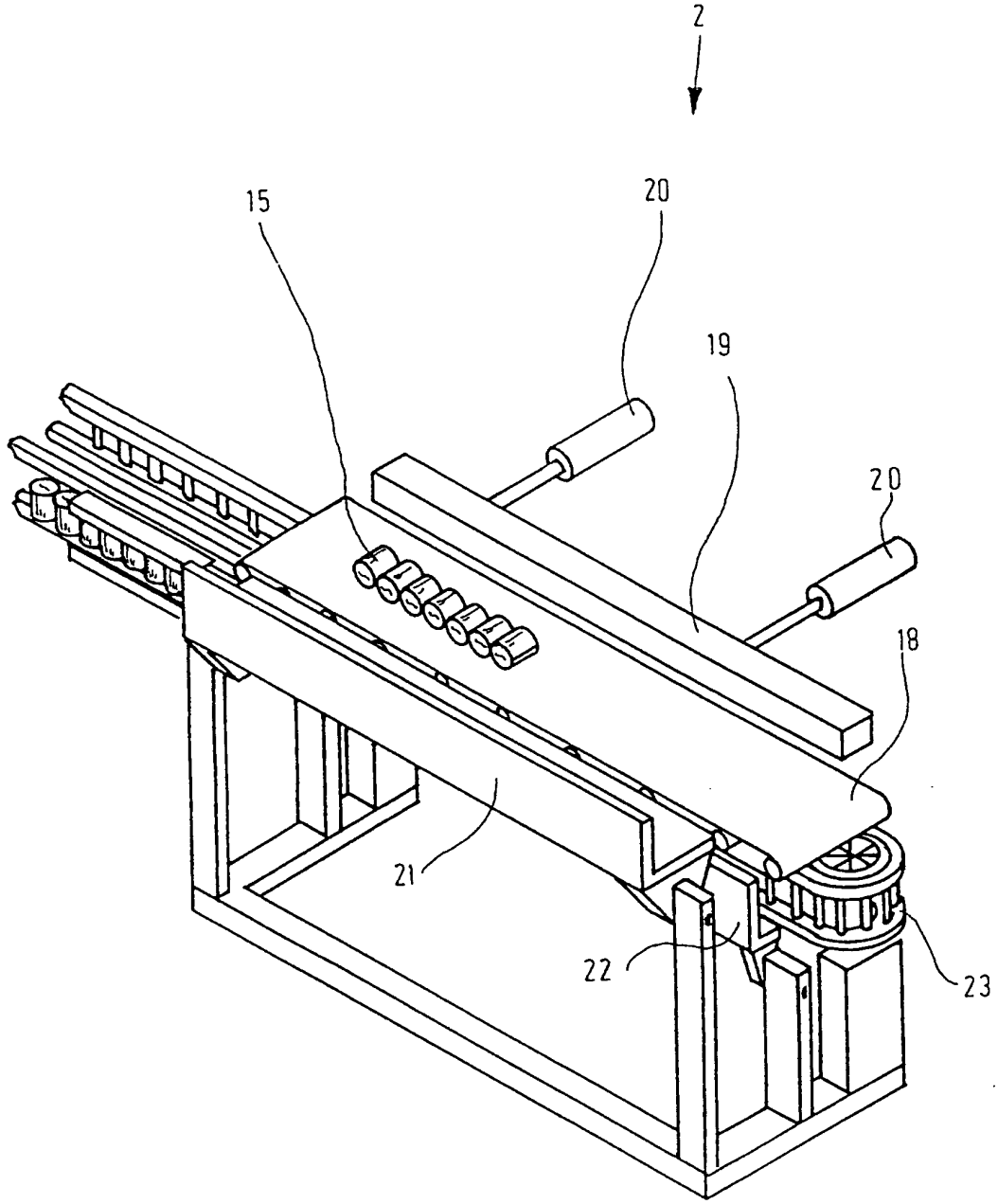

Fig 4.

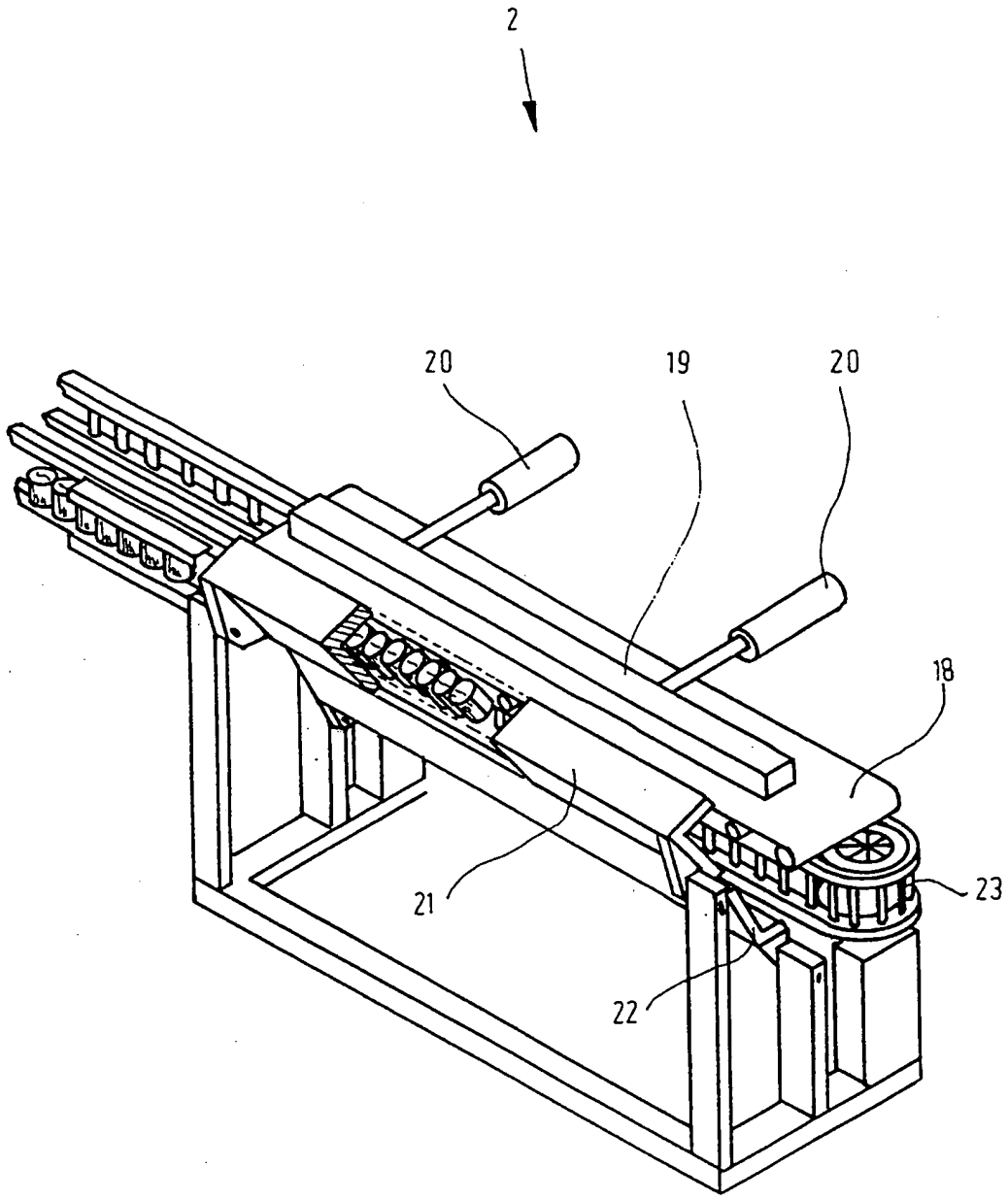

Fig 5.

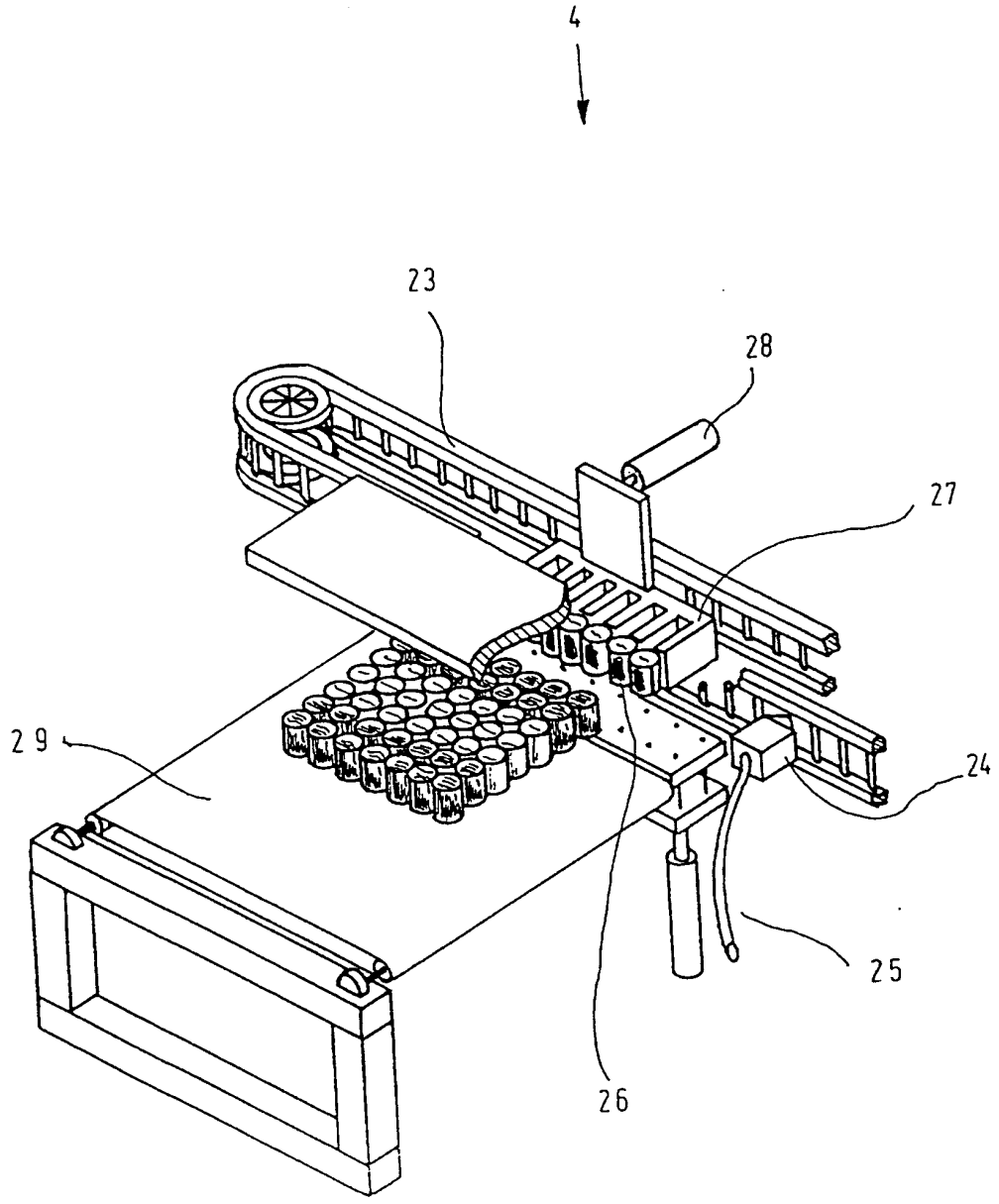

Fig 6.

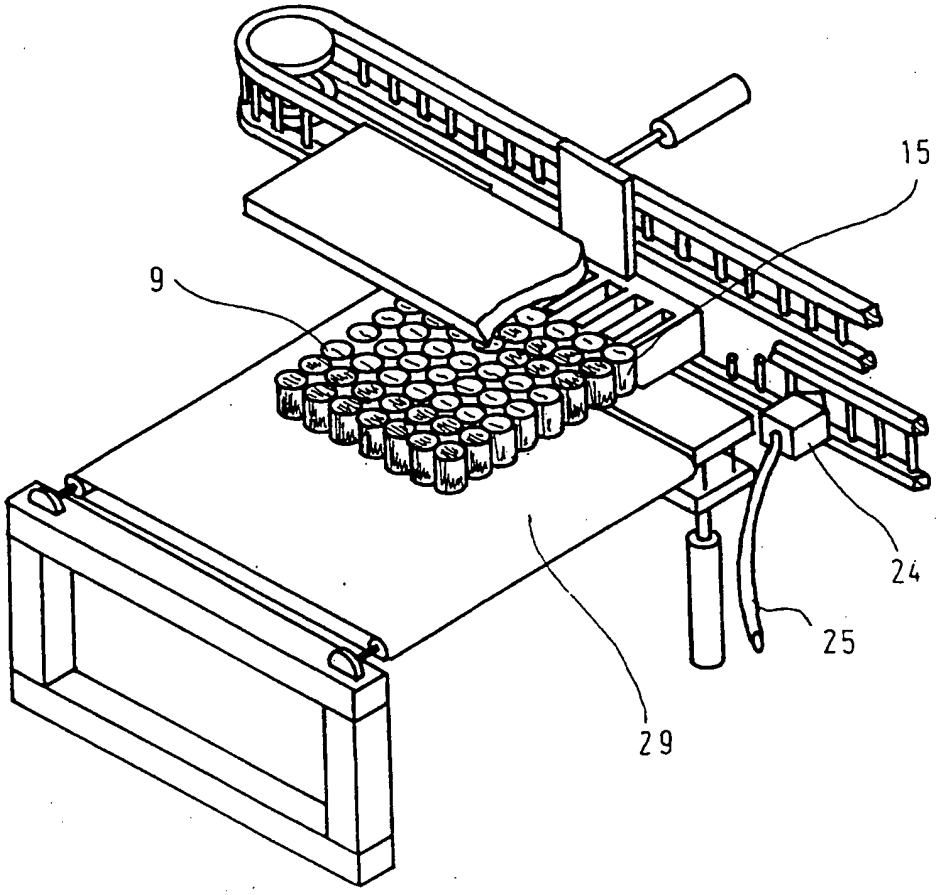

Fig 7.